Amendments to the Claims

Please cancel claims 4 and 11, and amend claims 1, 5-8, 12-14, 29-30, 59, 64 and 69 in accordance with the following listing of claims.

1.   (Currently Amended) A satellite communication system comprising:

a terrestrial base station; and

a first satellite communicating with said terrestrial base station using an infrared signal,

wherein said first satellite is configured in an inclined elliptical orbit having an apogee at or near zenith for said terrestrial base station,

wherein an optimal location of said terrestrial base station for said communicating is determined based on a wavelength of said infrared signal and an attenuation of said infrared signal between said terrestrial base station and said first satellite at said wavelength, ~~and~~

wherein said attenuation <u>of said infrared signal</u> is determined based on a cloud water content ~~for communication~~ at ~~zenith, persisting~~ <u>zenith persisting</u> in a region in which said terrestrial base station is located<u>, and</u>

<u>wherein said cloud water content is determined based on an empirical model for millimeter wave attenuation at zenith in said region</u>.

2-4.   (Canceled)

5.   (Currently Amended) The satellite communication system of claim [[4]] <u>1</u>, <u>wherein said optimal location of said terrestrial base station is defined by longitude and latitude, and</u> wherein said cloud water content is determined at the longitude and latitude of said terrestrial base station based on an exceedance probability <u>for said cloud water content</u>.

6.   (Currently Amended) The satellite communication system of claim [[4]] <u>5</u>, wherein said cloud water content is determined ~~at the longitude and latitude of said terrestrial base station~~ based on a cloud water content formula <u>which expresses said cloud water content as a function of said exceedance probability and said longitude and latitude of said terrestrial base station</u>.

AMENDMENT   09/986,057

7.   (Currently Amended) The satellite communication system of claim 1, wherein said attenuation is determined <u>also</u> based on a probability density function of an elevation angle to said first satellite from said terrestrial base station.

8.   (Currently Amended) A satellite communication system comprising:

a terrestrial base station; and

a constellation of satellites each communicating directly with said terrestrial base station using an infrared signal, said constellation comprising at least a first satellite, a second satellite, a third satellite, a forth satellite and a fifth satellite, said first satellite, said second satellite and said third satellite each being in a phased Molniya orbit, and said fourth satellite and said fifth satellite each being in a geosynchronous orbit,

wherein an optimal location of said terrestrial base station for said communicating is determined based on a wavelength of said infrared signal and an attenuation of said infrared signal between said terrestrial base station and said first satellite at said wavelength, ~~and~~

wherein said attenuation <u>of said infrared signal</u> is determined based on a cloud water content ~~for communication~~ at ~~zenith, persisting~~ <u>zenith persisting</u> in a region in which said terrestrial base station is located<u>, and</u>

<u>wherein said cloud water content is determined based on an empirical model for millimeter wave attenuation at zenith in said region.</u>

9-11.   (Canceled)

12.   (Currently Amended) The satellite communication system of claim ~~11~~ <u>8</u>, <u>wherein said optimal location of said terrestrial base station is defined by longitude and latitude, and</u> wherein said cloud water content is determined at the longitude and latitude of said terrestrial base station based on an exceedance probability <u>for said cloud water content</u>.

13.   (Currently Amended) The satellite communication system of claim ~~11~~ <u>12</u>, wherein said cloud water content is determined ~~at the longitude and latitude of said terrestrial base station~~ based on a cloud water content formula <u>which expresses said cloud water content as a function of said exceedance probability and said longitude and latitude of said terrestrial base station</u>.

14.   (Currently Amended) The satellite communication system of claim 8, wherein said attenuation is determined ~~also~~ based on a probability density function of an elevation angle to said constellation of satellites from said terrestrial base station.

15-28. (Canceled)

29.   (Currently Amended) A method for determining an optimal location for a terrestrial base station communicating with a satellite using an infrared signal, said method comprising the steps of:

determining a cloud water content ~~for communication at zenith, persistent~~ at zenith persisting at each of a plurality of locations, said cloud water content being determined based on an empirical model for millimeter wave attenuation at zenith at said locations;

determining an attenuation of said infrared signal at each of said plurality of locations based on said cloud water content and on a probability density function of an elevation angle to said satellite from said locations;

determining which one of the plurality of locations has the least attenuation; and

selecting as an optimum location, the one location having the least attenuation.

30.   (Currently Amended) The method of claim 29, wherein the step of determining said cloud water content at each of said plurality of locations is based on an exceedance probability for said cloud water content.

31.   (Previously Presented) The method of claim 30, wherein said step of determining said cloud water content at each of said plurality of locations is based on a cloud water content formula which expresses cloud water content as a function of said exceedance probability and location latitude and longitude.

32-51. (Canceled)

52.   (Previously Presented) The satellite communication system of claim 1, wherein said communicating occurs only when said first satellite is in a portion of said elliptical orbit which is at or near the apogee.

53.   (Previously Presented) The satellite communication system of claim 1, wherein said elliptical orbit is inclined at critical inclination.

54.   (Previously Presented) the satellite communications system of claim 1, wherein the wavelength of said infrared signal is about 10 microns.

55.   (Previously Presented) The satellite communication system of claim 8, wherein said communicating with the first, second and third satellites occurs only when each of said first, second and third satellites is in a portion of said Molniya orbit which is at or near apogee.

56.   (Previously Presented) The satellite communication system of claim 8, wherein said Molniya orbit is inclined at critical inclination.

57.   (Previously Presented) The satellite communications system of claim 8, wherein the wavelength of said infrared signal is about 10 microns.

58.   (Previously Presented) The method of claim 29, wherein said infrared signal has a wavelength of about 10 microns.

59.   (Currently Amended) A satellite communication system comprising:
        a first terrestrial base station located in a selected region;
        a second terrestrial base station located in said selected region at a specified distance from said first terrestrial base station; and
        a satellite adapted to communicate with said first terrestrial base station using a first infrared signal and with said second terrestrial base station using a second infrared signal,
        wherein said satellite is configured in an inclined elliptical orbit having an apogee at or near zenith for said first and second terrestrial base stations,

wherein said selected region is selected to minimize attenuation of said first and second infrared signals between said terrestrial base stations and said satellite, said attention of said infrared signals being determined based on a cloud water content persistent in said selected region for communication at zenith, and said cloud water content being determined based on an empirical model for millimeter wave attenuation at zenith in said selected region, and

wherein communication with said satellite is switched between said first terrestrial base station and said second terrestrial base station so as achieve at any time the greatest communication link performance.

60.   (Previously Presented) The satellite communication system of claim 59, wherein said communication occurs only when said satellite is in a portion of said elliptical orbit which is at or near the apogee.

61.   (Previously Presented) The satellite communication system of claim 59, wherein said elliptical orbit is inclined at critical inclination.

62.   (Previously Presented) the satellite communications system of claim 59, wherein each of said first and second infrared signals has a wavelength of about 10 microns.

63.   (Previously Presented) The satellite communications system of claim 59, wherein said cloud water content in said selected region is determined based on a cloud water content formula which expresses cloud water content as a function of an exceedance probability and said selected region's latitude and longitude.

64.   (Currently Amended) A satellite communication system comprising:

a terrestrial base station located in a selected region;

a first satellite adapted to communicate with said terrestrial base station using a first infrared signal; and

a second satellite adapted to communicate with said terrestrial base station using a second infrared signal,

wherein said first and second satellite are configured in an inclined elliptical orbit having an apogee at or near zenith for said terrestrial base station, and are phased so as to be able to communicate with said terrestrial bas station simultaneously,

wherein said selected region is selected to minimize attenuation of said first and second infrared signals between said terrestrial base station and said first and second satellites, said attention of said infrared signals being determined based on a cloud water content persistent in said selected region for communication at zenith, and said cloud water content being determined based on an empirical model for millimeter wave attenuation at zenith in said selected region, and

wherein communication with said terrestrial base station is switched between said first satellite and said second satellite so as achieve at any time the greatest communication link performance.

65.   (Previously Presented) The satellite communication system of claim 64, wherein said communication occurs only when said first and second satellites are in a portion of said elliptical orbit which is at or near the apogee.

66.   (Previously Presented) The satellite communication system of claim 64, wherein said elliptical orbit is inclined at critical inclination.

67.   (Previously Presented) The satellite communications system of claim 64, wherein the wavelength of said infrared signals is about 10 microns.

68.   (Previously Presented) The satellite communications system of claim 64, wherein said cloud water content in said selected region is determined based on a cloud water content formula which expresses cloud water content as a function of an exceedance probability and said selected region's latitude and longitude.

69.   (Currently Amended) An air-ground communication system comprising:
        a terrestrial base station located in a selected region; and

an aircraft adapted to communicate with said terrestrial base station using an infrared signal,

wherein said aircraft flies at high altitude in a closed path so as to be able to communicate continuously with said terrestrial base station at or near zenith,

wherein said selected region is selected to minimize attenuation of said infrared signal between said terrestrial base station and said aircraft, said attention of said infrared signals being determined based on a cloud water content persistent in said selected region for communication at zenith, and said cloud water content being determined based on an empirical model for millimeter wave attenuation at zenith in said selected region.

70.   (Previously Presented) The air-ground communications system of claim 69, wherein the wavelength of said infrared signal is about 10 microns.

71.   (Previously Presented) The air-ground communications system of claim 69, wherein said cloud water content in said selected region is determined based on a cloud water content formula which expresses cloud water content as a function of an exceedance probability and said selected region's latitude and longitude.